# Strategic R&D Messaging

Presented to: Research Engineering & Development Advisory Board (REDAC)

By: Shelley Yak, Director
William J. Hughes Technical Center

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Federal Aviation Administration

# Briefing Purpose:

**Obtain feedback: *Strategic Outlook for Aviation Research (SOAR) Charts***

# Agenda:

- **Current: R&D Portfolio Messaging**
- **Need for change**
- **Initiative: Strategic Outlook for Aviation Research Charts**
- **Sample charts**
- **Next Steps**

# Research, Development, Test and Evaluation

## Aircraft Safety Assurance

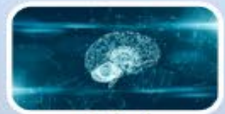
Fire Safety

Aircraft Structures

Propulsion & Fuel Systems

## Digital Systems & Technologies

Digital Systems



Digital Technologies

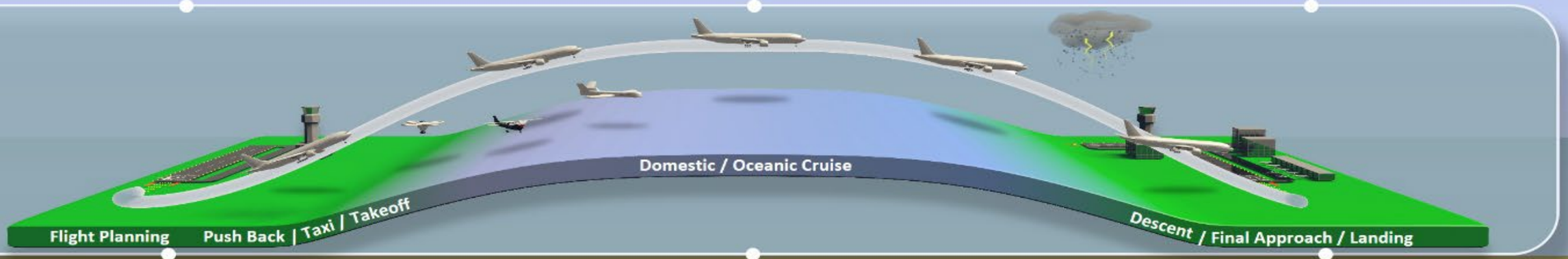
Cyber Security

## Environmental & Weather Impact Mitigation

Weather

Icing

Environmental & Energy / Fuels



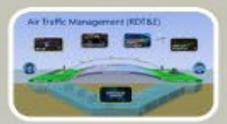

## Airport Infrastructure & Technologies

Airport and Terminal

Pavement

## Aerospace Performance & Planning

System Safety Management



Air Traffic Management

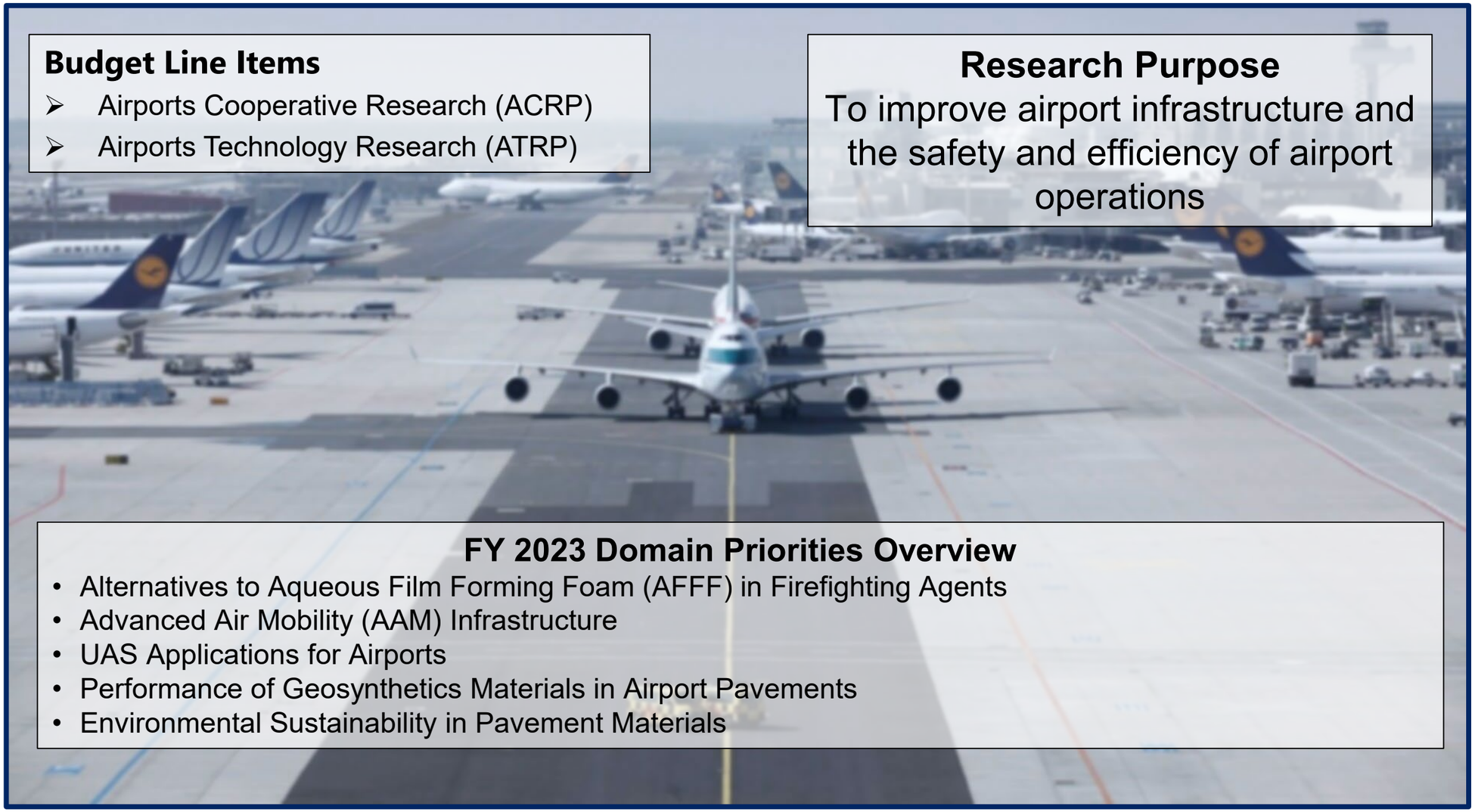
Emerging Operations

## Human & Aeromedical Factors

Human Factors

Aeromedical Factors

# Airport Infrastructure and Technologies



**Budget Line Items**

- Airports Cooperative Research (ACRP)
- Airports Technology Research (ATRP)

**Research Purpose**

To improve airport infrastructure and the safety and efficiency of airport operations

**FY 2023 Domain Priorities Overview**

- Alternatives to Aqueous Film Forming Foam (AFFF) in Firefighting Agents
- Advanced Air Mobility (AAM) Infrastructure
- UAS Applications for Airports
- Performance of Geosynthetics Materials in Airport Pavements
- Environmental Sustainability in Pavement Materials

# Need for Change

**FACT:** FAA’s yearly messaging is repetitive and focused on near-term

**Perception:**

- FAA’s research doesn't end or conclude
- FAA’s research is not completed in a timely manner to have an impact
- FAA’s research does not keep pace with technology trends and industry needs

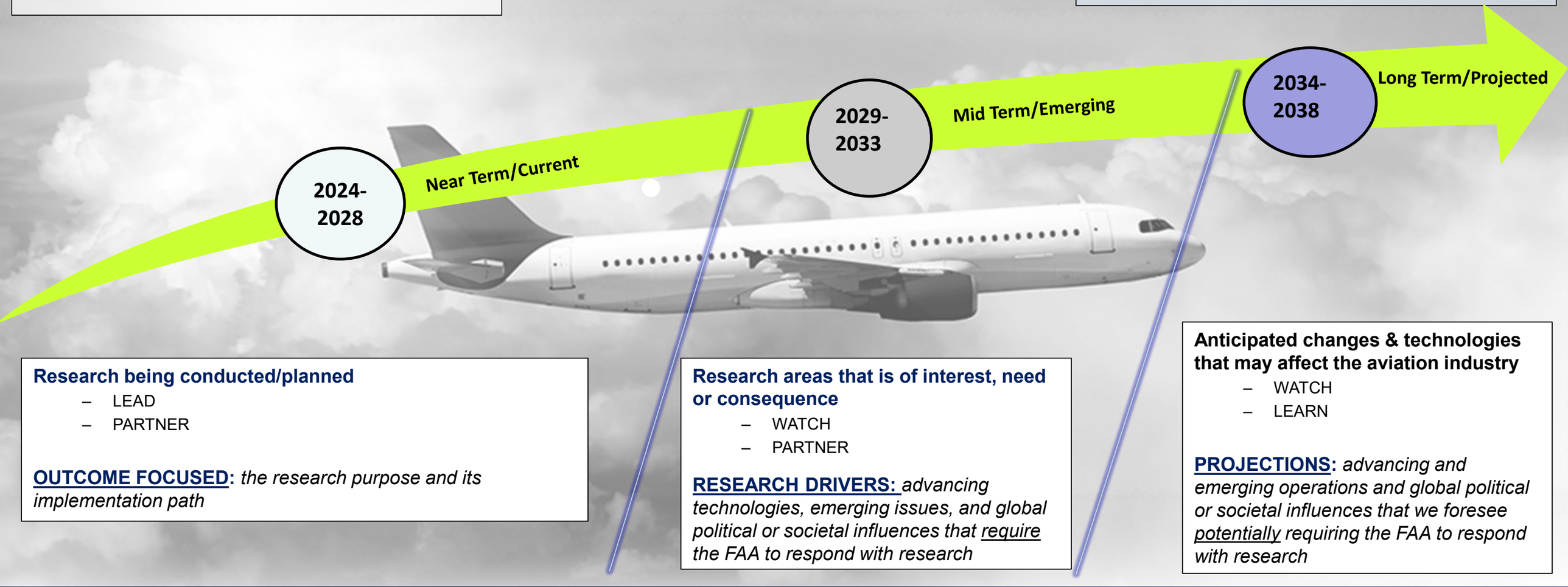
**Need:** Share and facilitate discussion on FAA’s R&D portfolio/strategy:

- What will FAA’s R&D results be used for (expected outcomes)
- What is happening in industry and what are FAA’s R&D plans/response (research drivers)
- What do we foresee as a potential long-term research need/requirement (projections)

# Strategic Outlook for Aviation Research: “DOMAIN AREA”

- **Budget Line Items represented**

**Purpose for research**




**Research being conducted/planned**

- LEAD
- PARTNER

**OUTCOME FOCUSED:** *the research purpose and its implementation path*

**Research areas that is of interest, need or consequence**

- WATCH
- PARTNER

**RESEARCH DRIVERS:** *advancing technologies, emerging issues, and global political or societal influences that require the FAA to respond with research*

**Anticipated changes & technologies that may affect the aviation industry**

- WATCH
- LEARN

**PROJECTIONS:** *advancing and emerging operations and global political or societal influences that we foresee potentially requiring the FAA to respond with research*

# Strategic Outlook for Aviation Research:
## Airport Infrastructure & Technologies

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**2024-2028** — Near Term/Current

- Development of airport pavement materials analytical tools (PANDA-AP)
- **Full scale testing of geosynthetics** in airport pavements
- Lead integration of FAA pavement software into one suite of tools for pavement design, analysis and management.
- AI/ML in pavement analysis
- **Research on recycled pavement materials**
- Development of initial infrastructure **vertiport guidance for Advanced Air Mobility (AAM) aircraft**
- **Transition to Fluorine Free Foam (F3)**
- Research for UAS Airport Applications
- Improvements to databases for Foreign Object Debris (FOD) & wildlife
- Research on Solar-Powered Airfield Lighting systems

**2029-2033** — Mid Term/Emerging

- Testing and characterization of **low-embodied carbon materials airport pavements**
- Advanced asphalt / concrete materials
- **Environmentally friendly and sustainable pavement materials**
- Development of standards for **autonomous vehicles on airports**
- **SMART lighting & signage**
- Airport design changes for resiliency and climate change
- **Emerging entrants** - eVTOL (electric Vertical Take-Off Landing ), eSTOL (electric Short Take-Off Landing), hydrogen powered, Supersonic, autonomous vehicles etc.

**2034-2038** — Long Term/Projected

- Pavement sensor technologies
- **Carbon capturing /advanced materials**
- Improved pavement performance prediction models
- UAS platforms
- **Safety sensor technologies**
- **AAM infrastructure**
- **Supersonic infrastructure**
- Autonomous vehicles
- **SMART Airport Technologies**
- Hybrid electric aircraft

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**Researching infrastructure and technologies for safe integration into the airport environment**

# Next Steps

- **Continue refining charts**
- Share charts for review and input at next REDAC subcommittee meetings
- Update and finalize charts
- Develop Domain level charts and identify macro-level trends
- Use charts as part of FY25 Communications (NARP & Budget briefings)


Questions